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## Gastrointestinal Bleeding and Gastric Outlet Obstruction From Peutz-Jeghers Polyposis: Diagnosis and Treatment

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PEUTZ-JEGHERS SYNDROME is an uncommon disorder, inherited in an autosomal dominant pattern, and characterized by mucocutaneous pigmentation and hamartomatous polyps.<sup>1–4</sup> Although these polyps have been described in many organs, including the nasopharynx, gallbladder, and urinary bladder, they are seen primarily in the gastrointestinal tract. In the gastrointestinal tract, the polyps may cause bleeding, obstruction, and intussusception. Only three cases of patients with gastric outlet obstruction from Peutz-Jeghers polyps have been described, all of which were treated surgically.<sup>5–7</sup>

We describe a case of Peutz-Jeghers polyposis in an adolescent with Bardet-Biedl syndrome presenting with symptoms of small bowel obstruction, hematochezia, and gastric outlet obstruction. He was successfully treated by a combined endoscopic and surgical approach. This is the first report of the successful endoscopic treatment of gastric outlet obstruction from Peutz-Jeghers polyposis.

The Bardet-Biedl syndrome is a genetic disorder inherited in an autosomal recessive pattern, usually characterized by having at least four of five cardinal signs. These signs are mental retardation, obesity, hypogenitalism, polydactyly, and pigmentary retinopathy. Some au-

thors do not include mental retardation as one of the cardinal signs.<sup>8</sup> There is no known association of the Bardet-Biedl syndrome with intestinal polyposis.

### Report of a Case

The patient, a 15-year-old male adolescent, was previously diagnosed with the Bardet-Biedl syndrome. For three months, he had weekly abdominal pain characterized by severe periumbilical and left upper quadrant cramping that lasted 30 to 90 minutes, then spontaneously resolved. Separate from these episodes, he had weekly postprandial vomiting—30 to 90 minutes after meals—of partially digested, nonbilious material. During this time he also noted three episodes of hematochezia that filled the toilet bowl with blood. His bowel movements between these episodes were normal.

His father had moderate perioral and acral melanosis and required a blood transfusion due to hematochezia when he was in his 20s; an operation in China at that time removed a probable intestinal polyp. The patient's brother also had the Bardet-Biedl syndrome, diagnosed by the presence of developmental delay, retinitis pigmentosa, moderate obesity (>95th percentile for age), and polydactyly; he did not have any gastrointestinal symptoms. Neither parent possessed characteristics of the Bardet-Biedl syndrome, although the father has distant relatives in China with learning disabilities and visual problems.

On examination the patient appeared healthy but overweight (>95th percentile), and he had a blunted affect. He had mild perioral, buccal, pharyngeal, acral, and genital melanosis. His hands showed surgically corrected polydactyly, and his feet had uncorrected postaxial polydactyly. His genitalia had previously been noted to be normal for his age. His fundi were poorly visualized, and a previous optometric examination revealed astigmatism.

On colonoscopy to the cecum, several large polyps greater than 2 cm were noted; these were removed during two procedures, with initial resolution of his hematochezia.



**Figure 1.**—Endoscopy shows gastric outlet obstruction from a prepyloric polyp.

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An upper endoscopy to evaluate his vomiting revealed a large prepyloric polyp prolapsing into the duodenum and causing obstruction of the gastric outlet (Figure 1). This polyp was removed with snare electrocautery (Figure 2). Another polyp was noted in the duodenal bulb, but was not removed at that time. An enteroclysis revealed several polyps throughout the small intestine, including a 3- to 4-cm polyp in the midjejunum with pronounced small bowel dilation proximal to it. The pathology report on the polyps showed hamartomatous changes consistent with Peutz-Jeghers polyposis (Figure 3).

After the prepyloric polyps were removed, the patient's postprandial vomiting resolved, although he continued having episodes of severe abdominal pain two to three times per week. Before a planned attempt at endoscopic removal of the small bowel polyps, he had an episode of prolonged abdominal pain with left upper quadrant abdominal distention. He was admitted to a hospital, and a laparotomy confirmed an extensive small bowel intussusception. After the small bowel was palpated, 15 polyps were removed using multiple enterotomies. His abdominal pain completely resolved postoperatively. He had a self-limited episode of hematochezia one month later, at which time a colonoscopy was normal, and an enteroclysis demonstrated a residual 1.5-cm polyp in the distal small bowel not palpated at the time of laparotomy. There have been no subsequent episodes of hematochezia in the year since his operation.

The patient's older brother underwent a physical examination that did not show any perioral melanosis, and the results of a sigmoidoscopic examination were normal. The father declined an endoscopic examination.

## Discussion

Peutz-Jeghers polyposis may present in several different ways. In one large series of 222 patients, 43% presented with symptoms of obstruction, 23% with nonobstructive abdominal pain, 13.5% with rectal bleeding, and 7% with extrusion of a polyp.<sup>6</sup> Polyps in these patients occurred in the small intestine in 64%, the colon in 53%, the stomach in 49%, and the rectum in 32%.<sup>6</sup> Our patient had symptoms referable to virtually the entire gastrointestinal tract: gastric outlet obstruction and vomiting from a gastric polyp, bright red rectal bleeding from colonic polyps, and intermittent small bowel intussusception with abdominal pain from a small bowel polyp.

Gastric outlet obstruction due to Peutz-Jeghers polyps has been reported rarely in the literature and has not previously been successfully treated endoscopically.<sup>5</sup>

Peutz-Jeghers polyposis is an uncommon cause of rectal bleeding in children and adolescents. In one tertiary referral center's series of 730 children younger than 16 years who underwent colonoscopy for the evaluation of rectal bleeding of unknown origin or inflammatory bowel disease, 29 patients were found to have polyps, but only 2 had Peutz-Jeghers polyposis.<sup>9</sup>

The Peutz-Jeghers syndrome has been associated in most age-controlled studies with an increased risk of cancer.<sup>10</sup> These include intestinal adenocarcinoma, pancreatic

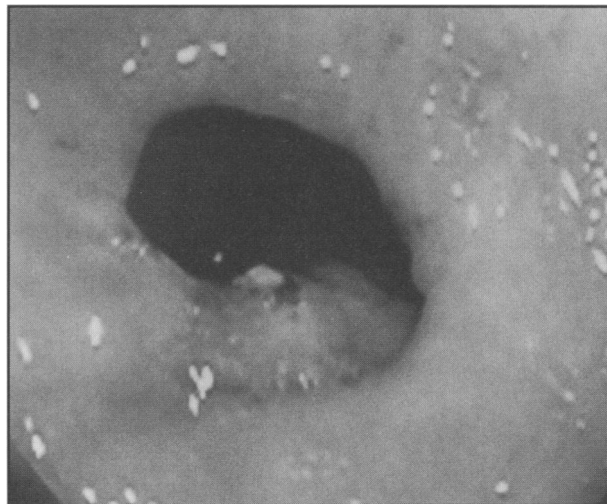


Figure 2.—A patent pylorus is seen after endoscopic polypectomy.

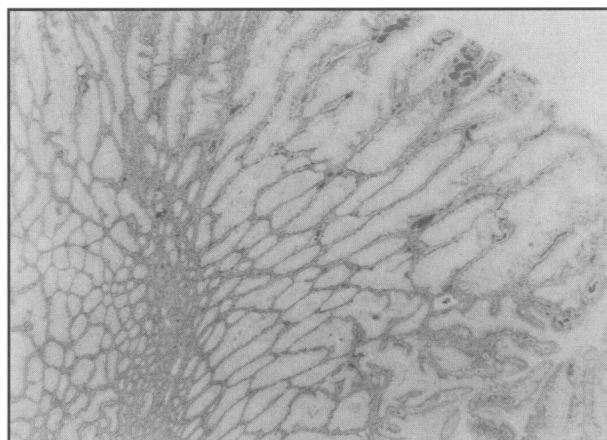


Figure 3.—A hamartomatous polyp on standard microscopy shows mature, disorganized, specialized intestinal epithelial cells (hematoxylin and eosin stain, original magnification  $\times 100$ ).

adenocarcinoma, and extraintestinal malignant lesions of the reproductive system and breast.<sup>11-13</sup> Although one series did not report an increased risk of cancer or death in patients with the Peutz-Jeghers syndrome, most have reported a risk of dying of cancer by the sixth decade of life as high as 48%.<sup>6,9,13</sup> The exact mechanism leading to an increased malignant potential in these patients is unclear, although a slight increase in chromosomal instability has been noted.<sup>15</sup> The intestinal polyps may progress through an adenoma-carcinoma sequence, as adenomatous changes containing adenocarcinoma have been observed within Peutz-Jeghers hamartomas.<sup>15</sup>

The genetic defect that causes the Peutz-Jeghers syndrome does not appear to be closely chromosomally linked to the defect causing the Bardet-Biedl syndrome, as our patient expressed both of these genetic disorders but his brother possessed only one. The Bardet-Biedl syndrome possesses some genetic heterogeneity, with loci reported on chromosomes 3, 11, 15, and 16.<sup>16-18</sup> Because the Peutz-Jeghers syndrome is inherited in an autosomal dominant pattern and should be expressed in the brother

if closely linked with the brother's autosomal recessive Bardet-Biedl syndrome, these disorders probably segregate separately on different chromosomes or on more remote locations of the same chromosome.

The management of patients with the Peutz-Jeghers syndrome remains controversial. The World Health Organization (WHO) in its recommendations for screening patients with heritable factors for colorectal cancer recommends annual fecal occult blood testing and flexible sigmoidoscopy every three years in the second decade for asymptomatic family members at risk.<sup>19</sup> If the diagnosis is established, endoscopy of the upper and lower gastrointestinal tracts should be performed every three to five years. Small bowel x-ray films are recommended on a similar schedule. Although polyps found at endoscopy should be removed, there are no WHO recommendations concerning asymptomatic small bowel polyps found by small bowel radiographs that are beyond the reach of the standard endoscope. Enteroscopy using a dedicated enteroscope with the endoscopic removal of duodenal and some jejunal polyps may be helpful, although this technique has not yet been reported. This approach was originally planned with this patient, but the prolonged intussusception necessitated surgical intervention. We currently plan endoscopic removal of this patient's residual small bowel polyp during a future screening examination. Intraoperative small bowel endoscopy with intraluminal transillumination of the bowel has been shown to increase the number of polyps found and decrease the need for recurrent laparotomies.<sup>20</sup>

## Conclusion

Familial gastrointestinal polyposis syndromes such as the Peutz-Jeghers syndrome are uncommon causes of gastrointestinal complaints, but should be considered in young patients presenting with symptoms of gastric outlet obstruction, gastrointestinal bleeding, or small bowel obstruction. We report successful endoscopic treatment of gastric outlet obstruction from a Peutz-Jeghers polyp. Because most hamartomatous polyps can be successfully removed endoscopically with low morbidity, endoscopic polypectomy should be considered initially, unless the patient has other indications for surgical treatment.

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